



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2005WI91B

Title: Occurrence of Estrogenic Endocrine Disruptors in Groundwater

Project Type: Research

Focus Categories: Water Quality, Toxic Substances, Methods

Keywords: drinking water, contaminants, endocrine disruptors

Start Date: 03/01/2005

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Non-Federal Matching Funds: \$19,776

Congressional District: 2

Principal Investigator:
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Abstract

Growing populations are influencing groundwater quantity and quality causing groundwater professionals to continually monitor and deal with emerging issues. Increasing demands for groundwater, resulting in infiltration of surface water into groundwater is a classic example of one of these issues. The drawdowns and cones of depression associated with high capacity municipal and agricultural wells placed near rivers have resulted in reversals in groundwater flows. This flow reversal then sets up a potential for contaminants from the river to be transmitted to groundwater by infiltration. Additionally, the proliferation of non-conventional small scale on site waste disposal systems in rural areas may provide another route for entrance of compounds of concern to groundwater. It is expected that such non-conventional systems will usually be installed in vulnerable groundwater settings, such as areas of shallow bedrock or high water tables, where conventional on-site septic systems would not be allowed. Of growing concern related to these phenomena, is the potential for detrimental human health effects associated with the presence of compounds in polluted surface waters known as endocrine disrupting compounds (EDCs). Infiltration of these EDCs into the groundwater may compromise the water quality and pose a risk to human health. The understanding of the occurrence of these compounds in Wisconsin groundwater is necessary to aid in future decision making regarding water use. A data base needs to be created regarding the

occurrence of EDC's in groundwater, and more specifically the occurrence in vulnerable areas near rivers and rural developments which use non-conventional waste treatment systems. This data will then allow informed negotiations within the water supply community regarding decisions that will protect the long term health of individuals who consume groundwater. The primary goal of this project is to determine the presence of estrogenic endocrine disrupting chemicals in groundwater by using the E-screen assay. Samples will be collected from high capacity municipal water supply wells located near surface waters impacted by industrial and municipal effluents. Wells from unsewered subdivisions that are likely under septic system influence will also be assayed for estrogenic activity. Samples that indicate estrogenic activity will be analysed with gas chromatography to identify which estrogenic compounds are responsible for the estrogenic activity with the E-screen. This study will help provide important data that could influence future decision making regarding important groundwater issues such as land use planning, water treatment options, well placement and water use.